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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,473	01/23/2004	Steven Don Arnold	H0004623-2900	6656

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EXAMINER	
TRIEU, THAI BA	
ART UNIT	**PAPER NUMBER**
3748	

DATE MAILED: 12/07/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/763,473	ARNOLD ET AL.	
	Examiner	Art Unit	
	Thai-Ba Trieu	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 October 2004*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1,3-8 and 10-13* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1,3-8 and 10-13* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *12 October 2004* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☐ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This Office Action is in response to the Amendment filed on October 12, 2004. Applicant's cooperation in correcting the informalities in the drawing and specification is appreciated. Applicant's cooperation in amending the claims to overcome the claim objections relating to informalities as well as indefinite claim language is also appreciated. Claims 1, 5-7, and 10-13 were amended, and Claims 2 and 9 were cancelled.

Claim Objections

Claims 1 is objected to because of the following informalities:

- In claim 1, line 13; ***"the second gear assembly"*** lacks antecedent basis in claim.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter, which the applicant regards as his invention.

Claim 12 is rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Specifically:

In claim 12, line 16, the recitation of " a predetermined degree of unison ring thermal expansion and contraction movement" renders the claim indefinite, since it is

not clear how the applicants can predetermine the degree of unison ring thermal expansion and contraction movement, without defining the material of the unison ring.

Additionally, lines 17-18, the recitation of " a desired degree" renders the claim indefinite, since it is not clear that which degree will be a desired degree of movement between the unison ring and rack gear. Applicant should define the degree being considered as a desired one of movement between the unison ring and rack gear.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

Claims 1, 3-8, and 10-13 are rejected under 35 U.S.C. 102(b) as best understood as being anticipated by Hefler et al. (Patent Number 3,243,159).

Regarding claims 1, 3-6, Hefler discloses an actuation assembly (10) for moving in unison ring (19) a plurality of aerodynamic vanes (24) disposed within a variable geometry turbocharger that includes an actuator coupled to a movable unison ring (19) disposed within a turbocharger turbine housing (11) and attached to the plurality of aerodynamic vanes (24), the actuation assembly comprising a crank arm (36) rotatably disposed within the turbine housing (11) and attached at a first end to the actuator and to a second end to the unison ring (19), wherein the crank arm second end includes a first gear member (35) comprising teeth, and the unison ring (19) includes a

second gear member (26) comprising teeth, and wherein the teeth of the first and second gear members are cooperatively engaged with one another (See Figures 1 and 4);

wherein the second gear assembly (26) is movably coupled to the unison ring (19) to permit unison ring thermal expansion and contraction movement during turbocharger operation while maintaining engagement between the first and second gear members (See Figure 4);

wherein the first gear member (35) is a pinion gear and the second gear member (36) is a rack gear (34) (See Figure 4);

wherein the rack gear (26, 34) and unison ring (19) are coupled to one another by cooperative surface features (See Figures 1-2 and 4);

wherein the cooperative surface features comprise a tongue (27) that cooperates within an opening (28), and wherein the tongue and opening are sized to permit the thermal expansion and contraction movement between the unison ring (19) and rack gear (26, 34) (See Figures 1-2 and 4); and

wherein the tongue (27) projects outwardly from the unison ring (19), and the opening (28) is disposed within a surface of the rack gear (26, 34) (See Figures 1-2 and 4, Column 1, lines 65-72, Column 2, lines 1-72, and Column 3, lines 1-42).

Regarding claims 7-8, 10-11, Hefler discloses a turbocharger assembly comprising:

a turbine housing (11);

a turbine wheel (15) carried within the turbine housing and attached to a shaft (16);

a plurality of vanes (24) pivotably disposed within the turbine housing (11);

a unison ring (19) attached to the plurality of vanes (24) to move the vanes in unison ring (19) with one another, the unison ring (19) including a first gear member (26, 34) having teeth attached thereto; and

a crank arm (36) disposed within the turbine for moving the unison ring (19), the crank arm including a second gear member (35) at one of its ends having teeth that are engaged with the teeth of the first gear member (26, 34) (See Figures 1-2 and 4);

means for maintaining engagement between the first (26, 34) and the second gear (35) members during operation of the turbocharger, the means being an attachment mechanism (27) between the unison ring and the first gear member (26,34); a cooperative attachment (27) between the rack gear (26, 34) and the unison ring (19);

wherein the first gear member (26, 34) is a rack gear and the second gear member (35) is a pinion gear; and

wherein the cooperative attachment comprises a tongue (27) that projects from one of the unison ring (19) and rack gear (26, 34), into an opening (28) of the other of the unison ring and rack gear (See Figures 1-2 and 4, Column 1, lines 65-72, Column 2, lines 1-72, and Column 3, lines 1-42).

Regarding claim 12, Hefler discloses a turbocharger assembly comprising:

a turbine housing (11);

a turbine wheel (15) carried within the turbine housing and attached to a shaft (16);

a plurality of vanes (24) pivotably disposed within the turbine housing (11);

a unison ring (19) attached to the plurality of vanes (24) to move the vanes in unison ring with one another, the unison ring including a rack gear (26, 34) having teeth attached thereto;

a crank arm (36) disposed within the turbine for affecting movement of the unison ring (19), the crank arm including a pinion gear (35) at one of its ends that has teeth that are engaged with the teeth of the rack gear (26, 34); wherein the gear rack (26, 34) is movably attached to the unison ring (19) to permit a predetermined degree of unison ring thermal movement during turbocharger operation while maintaining a desired tolerance between the pinion gear and rack gear (See Figures 1-2 and 4, Column 1, lines 65-72, Column 2, lines 1-72, and Column 3, lines 1-42).

Regarding claim 13, the method as claimed would be inherent during the normal use and operation of Hefler device as disclosed (See Figures 1-2 and 4, Column 1, lines 65-72, Column 2, lines 1-72, and Column 3, lines 1-42).

Response to Arguments

Applicant's arguments filed on October 12, 2004 have been fully considered but they are not persuasive. Accordingly, Claims ***1, 3-8, and 10-13*** are pending.

In response to the applicants' argument on Page 16-17, applicants state that *"Hefler fails to disclose or remotely suggest the invention as recited in the pending claims comprising a gear member that is movably attached or coupled to the unison rings.* Accordingly, *because the gear segment is integral with the drive ring, thermal expansion of the drive ring during turbocharger operation can and likely will cause the tolerance between the gear segment and pinion to close, and possibly cause undesired binding."*

Examiner respectfully disagrees with the applicants, since Hefler, in Column 2, lines 25-30, discloses that the drive gear (26) is supported for a rotative movement relative to support plate/unison ring (19) on an annular flange (27), which meets the limitations having been claimed by the applicants.

Additionally, as the gear segment is integral with the drive ring as Hefler discloses, it not so sure that thermal expansion of the drive ring during turbocharger operation causes the tolerance between the gear segment and pinion to close, and undesired binding, because when a material is used to apply for gears, or gear segments, or pinion gears in a turbocharger turbine, the properties of this material has been known and the tolerance between gears has to be calculated to avoid undesired

binding as well as to improve the longevity, performance efficiency, and reliability of a device.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thai-Ba Trieu whose telephone number is (571) 272-4867. The examiner can normally be reached on Monday - Thursday (6:30-5:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion can be reached on (571) 272-4859. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

TTB
December 2, 2004

Thai-Ba Trieu
patent Examiner
Art Unit 3748